

20/512, 022

Examiner's Notes

6, 171, 393  
6, 270, 515  
6, 179, 910  
6, 315, 827

~~WILLIAM (38) 85-2-222~~

S (single or mono) (10a) (crystal #)  
S (Si or silicon)  
S (dip? or lower?) (10a) (seed (a) crystal #)  
S (axial or apical (8a) direction)  
S (<110>) (10a) (crystal (6a) orientation)  
S (inclined?) (8a) (crystal (4a) orientat?  
S (CZ or ~~crystal~~ SKi)

203 Key

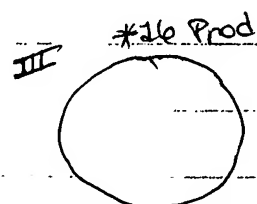
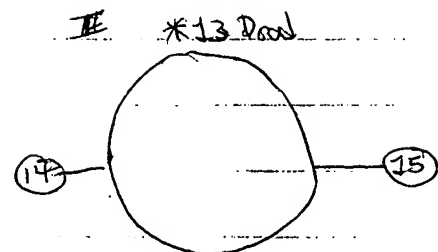
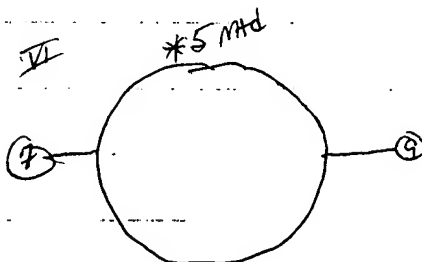
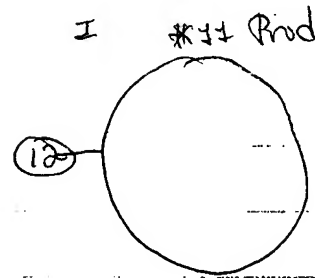
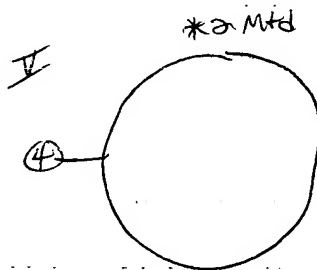
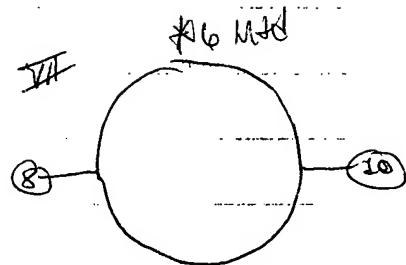
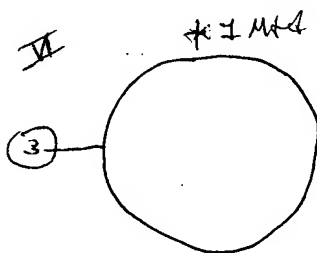
Claims 1, 3 & 11 - 14 & 16

Allowable Subj. Matter:

Claims 2 & 4 - 10

Object to:

Claims



STN

(HCAPLUS, WCAPLUS, HCAPLUS, HCAPLUS, HCAPLUS)

8/3/2006

=&gt; d 18 1-4 abs, bib

L8 ANSWER 1 OF 4 HCAPLUS COPYRIGHT 2006 ACS on STN  
 AB A method for eliminating slip dislocation when a single crystal Si is produced, a seed crystal for eliminating slip dislocation, a single crystal Si ingot from which slip dislocation is eliminated, and a single crystal Si wafer are disclosed. A single crystal Si is produced by dipping a seed crystal in a melt and pulling the seed crystal up along the axis of the seed crystal, using a single crystal such that the <110> crystal orientation is inclined at a predetd. angle with respect to the axial direction in such a way that the direction of the edge of the {111} crystal face is inclined with respect to the axial direction. When a single crystal Si is grown while pulling up a seed crystal by the CZ method, a single crystal Si ingot of a large diameter and a heavy weight can be pulled up by eliminating slip dislocation from the thick crystal.  
 AN 2003:856110 HCAPLUS  
 DN 139:330639  
 TI Single crystal silicon producing method, single crystal silicon wafer producing method, seed crystal for producing single crystal silicon, single crystal silicon ingot, and single crystal silicon wafer  
 IN Iida, Tetsuhiro; Shiraishi, Yutaka; Suewaka, Ryota; Tomioka, Junsuke  
 PA Komatsu Denshi Kinzoku Kabushiki Kaisha, Japan  
 SO PCT Int. Appl., 33 pp.  
 CODEN: PIXXD2  
 DT Patent  
 LA Japanese  
 FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI WO 2003089697	A1	20031030	WO 2003-JP4868	20030417
W: KR, SG, US				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR				
JP 2003313089	A2	20031106	JP 2002-118281	20020419
EP 1498516	A1	20050119	EP 2003-717609	20030417
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, SK				
US 2005229840	A1	20051020	US 2004-512022	20041019
PRAI JP 2002-118281	A	20020419		
WO 2003-JP4868	W	20030417		

RE.CNT 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 ALL CITATIONS AVAILABLE IN THE RE FORMAT

L8 ANSWER 2 OF 4 USPATFULL on STN  
 AB A method for eliminating slip dislocations in producing single crystal silicon, a seed crystal capable of eliminating the slip dislocations, a single crystal silicon ingot from which the slip dislocations have been eliminated and a single crystal silicon wafer, are disclosed. Single crystal silicon is produced by dipping a seed crystal in a melt and pulling the seed crystal up along the axis of the seed crystal, using a single crystal (1) in which the <110> crystal orientation (10) is inclined at a predetermined angle  $\theta$  with respect to the axial direction (9) so that the edge direction (8) of the {111} crystal plane is inclined with respect to the axial

direction (9). When single crystal silicon is grown while pulling up a seed crystal by the CZ method, a single crystal silicon ingot of a large diameter and a heavy weight can be pulled up by eliminating slip dislocations from the thick crystal.

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

AN 2005:264530 USPATFULL  
TI Single crystal silicon producing method,  
single crystal silicon wafer producing  
method, seed crystal for producing single  
crystal silicon, single crystal  
silicon ingot, and single crystal  
silicon wafer  
IN Iida, Tetsuhiro, Hiratsuka-shi, JAPAN  
Shiraishi, Yutaka, Hiratsuka-shi, JAPAN  
Suewaka, Ryota, Hiratsuka-shi, JAPAN  
Tomioka, Junsuke, Hiratsuka-shi, JAPAN  
PI US 2005229840 A1 20051020  
AI US 2003-512022 A1 20030417 (10)  
WO 2003-JP4868 20030417  
20041019 PCT 371 date  
PRAI JP 2002-118281 20020419  
DT Utility  
FS APPLICATION  
LREP WELSH & KATZ, LTD, 120 S RIVERSIDE PLAZA, 22ND FLOOR, CHICAGO, IL,  
60606, US  
CLMN Number of Claims: 16  
ECL Exemplary Claim: 1  
DRWN 8 Drawing Page(s)  
LN.CNT 872

CAS INDEXING IS AVAILABLE FOR THIS PATENT.

L8 ANSWER 3 OF 4 INPADOC COPYRIGHT 2006 EPO on STN

LEVEL 1

AN 285392023 INPADOC ED 20051103 EW 200544 UP 20051206 UW 200548  
TI Single crystal silicon producing method,  
single crystal silicon wafer producing  
method, seed crystal for producing single  
crystal silicon, single crystal  
silicon ingot, and single crystal  
silicon wafer.  
IN IIDA TETSUHIRO; SHIRAISHI YUTAKA; SUEWAKA RYOTA; TOMIOKA JUNSUKE  
INS IIDA TETSUHIRO; SHIRAISHI YUTAKA; SUEWAKA RYOTA; TOMIOKA JUNSUKE  
INA JP; JP; JP; JP  
PAS IIDA TETSUHIRO; SHIRAISHI YUTAKA; SUEWAKA RYOTA; TOMIOKA JUNSUKE  
PAA JP; JP; JP; JP  
TL English  
LA English  
DT Patent  
PIT USAA PATENT APPLICATION PUBLICATION (PRE-GRANT)  
PI US 2005229840 A1 20051020  
AI US 2004-512022 A 20041019  
PRAI JP 2002-118281 A 20020419 (EDPR 20031114)  
WO 2003-JP4868 W 20030417 (EDPR 20050120)

L8 ANSWER 4 OF 4 INPADOC COPYRIGHT 2006 EPO on STN

LEVEL 1

AN 220071303 INPADOC ED 20031114 EW 200346 UP 20050707 UW 200527  
TI SINGLE CRYSTAL SILICON PRODUCING METHOD,  
SINGLE CRYSTAL SILICON WAFER PRODUCING  
METHOD, SEED CRYSTAL FOR PRODUCING SINGLE

CRYSTAL SILICON, SINGLE CRYSTAL  
SILICON INGOT, AND SINGLE CRYSTAL  
SILICON WAFER.

PROCEDE DE PRODUCTION DE SILICIUM MONOCRISTALLIN, PROCEDE DE PRODUCTION  
DE TRANCHES DE SILICIUM MONOCRISTALLIN, CRISTAL GERME DESTINE A LA  
PRODUCTION DE SILICIUM MONOCRISTALLIN, LINGOT DE SILICIUM MONOCRISTALLIN,  
ET TRANCHE DE SILICIUM MONOCRISTALLIN.

IN IIDA, TETSUHIRO; SHIRAISHI, YUTAKA; SUEWAKA, RYOTA; TOMIOKA, JUNSUKE  
INS IIDA TETSUHIRO; SHIRAISHI YUTAKA; SUEWAKA RYOTA; TOMIOKA JUNSUKE  
INA JP; JP; JP; JP  
PA KOMATSU DENSHI KINZOKU KABUSHIKI KAISHA; IIDA, TETSUHIRO; SHIRAISHI,  
YUTAKA; SUEWAKA, RYOTA; TOMIOKA, JUNSUKE  
PAS KOMATSU DENSHI KINZOKU KABUSHI; IIDA TETSUHIRO; SHIRAISHI YUTAKA; SUEWAKA  
RYOTA; TOMIOKA JUNSUKE  
PAA JP; JP; JP; JP; JP  
TL English; French  
LA Japanese  
DT Patent  
PIT WO/01 PUBL.OF THE INT.APPL. WITH INT.SEARCH REPORT  
PI WO 2003089697 A1 20031030  
DS RW: AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LU MC NL PT RO SE  
SI SK TR  
W: KR SG US  
AI WO 2003-JP4868 A 20030417  
PRAI JP 2002-118281 A 20020419 (EDPR 20031114)

=> d his

(FILE 'HOME' ENTERED AT 07:07:40 ON 03 AUG 2006)

FILE 'HCAPLUS, INSPEC, JAPIO, USPATFULL, USPAT2, INPADOC' ENTERED AT  
07:07:55 ON 03 AUG 2006

L1 522833 S (SINGLE OR MONO) (8A) (CRYSTAL#)  
L2 2521855 S (SI OR SILICON)  
L4 1000573 S (AXIAL OR AXIAL (8A) DIRECTION)  
L5 655 S (INCLIN?) (8A) (CRYSTAL (6A) ORIENTAT?)  
L6 44213 S (CZ OR CZOCHRALSKI)  
L7 2691 S (110) (10A) (CRYSTAL (4A) ORIENTAT?)  
L8 4 S L1 AND L2 AND L4 AND L5 AND L6 AND L7

=>

Day : Thursday

Date: 8/3/2006

Time: 06:56:33

 PALM INTRANET**Inventor Name Search Result**

Your Search was:

Last Name = IIDA

First Name = TETSUHIRO

Application#	Patent#	Status	Date Filed	Title	Inventor Name
<u>08680522</u>	<u>5824152</u>	150	07/09/1996	SEMICONDUCTOR SINGLE-CRYSTAL PULLING APPARATUS	IIDA, TETSUHIRO
<u>08829412</u>	<u>5968260</u>	150	03/31/1997	METHOD FOR FABRICATING A SINGLE CRYSTAL SEMICONDUCTOR	IIDA, TETSUHIRO
<u>09297678</u>	<u>6228167</u>	150	05/09/1999	SINGLE CRYSTAL PULLING APPARATUS	IIDA, TETSUHIRO
<u>10512022</u>	Not Issued <i>Applicants' Invention</i>	30	10/19/2004	Single crystal silicon producing method, single crystal silicon wafer producing method, seed crystal for producing single crystal silicon, single crystal silicon ingot, and single crystal silicon wafer	IIDA, TETSUHIRO

**Inventor Search Completed: No Records to Display.**

**Search Another: Inventor**

<b>Last Name</b>	<b>First Name</b>
<input type="text" value="Iida"/>	<input type="text" value="Tetsuhiro"/>
<input type="button" value="Search"/>	

To go back use Back button on your browser toolbar.

Back to [PALM](#) | [ASSIGNMENT](#) | [OASIS](#) | [Home page](#)

Day : Thursday

Date: 8/3/2006  
Time: 06:56:54**PALM INTRANET****Inventor Name Search Result**

Your Search was:

Last Name = SHIRAISHI

First Name = YUTAKA

Application#	Patent#	Status	Date Filed	Title	Inventor Name
<u>08039206</u>	<u>5427056</u>	150	04/06/1993	APPARATUS AND METHOD FOR PRODUCING SINGLE CRYSTAL	SHIRAISHI, YUTAKA
<u>08135563</u>	<u>5450814</u>	150	10/14/1993	SINGLE CRYSTAL PULLING APPARATUS HAVING SLIDABLE SHIELD PLATE TO CONTROL AREA OF OPENING AROUND SINGLE CRYSTAL	SHIRAISHI, YUTAKA
<u>08214470</u>	Not Issued	166	03/18/1994	CONTROL OF OXYGEN CONCENTRATION IN SINGLE CRYSTAL PULLED UP FROM MELT CONTAINING GROUP-V ELEMENT	SHIRAISHI, YUTAKA
<u>08291833</u>	<u>5524574</u>	150	08/17/1994	CONTROL OF OXYGEN CONCENTRATION IN SINGLE CRYSTAL PULLED UP FROM MELT CONTAINING GROUP-V ELEMENT	SHIRAISHI, YUTAKA
<u>08399558</u>	<u>5488923</u>	150	03/07/1995	METHOD FOR PRODUCING SINGLE CRYSTAL	SHIRAISHI, YUTAKA
<u>08561835</u>	<u>5942169</u>	250	11/27/1995	OPTIMIZATION OF OVER-MOLDING METHOD FOR THREE-DIMENSIONAL HOLLOW MOLDED ARTICLE	SHIRAISHI, YUTAKA
<u>08649266</u>	<u>5660629</u>	150	05/17/1996	APPARATUS FOR DETECTING THE DIAMETER OF A SINGLE CRYSTAL SILICON	SHIRAISHI, YUTAKA
<u>08743046</u>	<u>5681758</u>	250	11/04/1996	METHOD FOR FABRICATING SEMICONDUCTOR SINGLE CRYSTAL	SHIRAISHI, YUTAKA
<u>09037515</u>	<u>6033472</u>	150	03/10/1998	SEMICONDUCTOR SINGLE CRYSTAL MANUFACTURING	SHIRAISHI, YUTAKA

				APPARATUS	
<u>09037516</u>	<u>6077348</u>	150	03/10/1998	SINGLE CRYSTAL PULLING APPARATUS, SINGLE CRYSTAL SUPPORT MECHANISM, AND SINGLE CRYSTAL PULLING METHOD	SHIRAISHI, YUTAKA
<u>09079233</u>	Not Issued	161	05/15/1998	OVER-MOLDING METHOD FOR A THREE-DIMENSIONAL HOLLOW MOLDED ARTICLE AND OPTIMIZATION OF THE OVER-MOLDING METHOD FOR A THREE-DIMENSIONAL HOLLOW MOLDED ARTICLE	SHIRAISHI, YUTAKA
<u>09284834</u>	<u>6217648</u>	150	04/21/1999	SINGLE CRYSTAL PULLING APPARATUS AND SINGLE CRYSTAL PULLING METHOD	SHIRAISHI, YUTAKA
<u>09403621</u>	<u>6361597</u>	250	11/05/1999	SINGLE CRYSTAL MATERIAL AUXILIARY MELTING APPARATUS AND SINGLE CRYSTAL MATERIAL MELTING METHOD	SHIRAISHI, YUTAKA
<u>10487286</u>	Not Issued	90	02/20/2004	SINGLE CRYSTAL SEMICONDUCTOR MANUFACTURING APPARATUS AND MANUFACTURING METHOD, AND SINGLE CRYSTAL INGOT	SHIRAISHI, YUTAKA
<u>10512022</u> <i>Applicants' Invention</i>	Not Issued	30	10/19/2004	Single crystal silicon producing method, single crystal silicon wafer producing method, seed crystal for producing single crystal silicon, single crystal silicon ingot, and single crystal silicon wafer	SHIRAISHI, YUTAKA

Inventor Search Completed: No Records to Display.

Search Another: Inventor

Last Name	First Name	
<input type="text" value="Shiraishi"/>	<input type="text" value="Yutaka"/>	<input type="button" value="Search"/>

To go back use Back button on your browser toolbar.

Back to [PALM](#) | [ASSIGNMENT](#) | [OASIS](#) | [Home page](#)

Day : Thursday

Date: 8/3/2006

Time: 06:57:08

 PALM INTRANET**Inventor Name Search Result**

Your Search was:

Last Name = SUEWAKA

First Name = RYOTA

Application#	Patent#	Status	Date Filed	Title	Inventor Name
10512022	Not Issued	30	10/19/2004	Single crystal silicon producing method, single crystal silicon wafer producing method, seed crystal for producing single crystal silicon, single crystal silicon ingot, and single crystal silicon wafer	SUEWAKA, RYOTA

*Applicants' Invention*

**Inventor Search Completed: No Records to Display.**

**Search Another: Inventor**

<b>Last Name</b>	<b>First Name</b>	
<input type="text" value="Suewaka"/>	<input type="text" value="Ryota"/>	<input type="button" value="Search"/>

To go back use Back button on your browser toolbar.

Back to [PALM](#) | [ASSIGNMENT](#) | [OASIS](#) | [Home page](#)



Day : Thursday

Date: 8/3/2006

Time: 06:57:23

PALM INTRANET

**Inventor Name Search Result**

Your Search was:

Last Name = TOMIOKA

First Name = JUNSUKE

Application#	Patent#	Status	Date Filed	Title	Inventor Name
<u>07772928</u>	<u>5316742</u>	150	10/08/1991	SINGLE CRYSTAL PULLING APPARATUS	TOMIOKA, JUNSUKE
<u>08030356</u>	<u>5385115</u>	150	03/17/1993	SEMICONDUCTOR WAFER HEAT TREATMENT METHOD	TOMIOKA, JUNSUKE
<u>08170175</u>	<u>5441014</u>	150	12/22/1993	APPARATUS FOR PULLING UP A SINGLE CRYSTAL	TOMIOKA, JUNSUKE
<u>08829412</u>	<u>5968260</u>	150	03/31/1997	METHOD FOR FABRICATING A SINGLE CRYSTAL SEMICONDUCTOR	TOMIOKA, JUNSUKE
<u>08861658</u>	Not Issued	164	05/22/1997	A METHOD OF FABRICATING A SEMICONDUCTOR SINGLE CRYSTAL AND A SINGLE CRYSTAL MATERIAL FABRICATED BY THE METHOD	TOMIOKA, JUNSUKE
<u>08941309</u>	<u>6007625</u>	150	09/30/1997	APPARATUS FOR MANUFACTURING SINGLE CRYSTAL	TOMIOKA, JUNSUKE
<u>08956434</u>	<u>5938836</u>	150	10/23/1997	APPARATUS AND METHOD FOR MANUFACTURING SEMICONDUCTOR SINGLE CRYSTALS	TOMIOKA, JUNSUKE
<u>08976340</u>	<u>5968262</u>	150	11/21/1997	METHOD OF FABRICATING SILICON SINGLE CRYSTALS	TOMIOKA, JUNSUKE
<u>08985248</u>	Not Issued	161	12/04/1997	APPARATUS FOR MANUFACTURING SINGLE CRYSTAL SILICON AND METHOD OF MANUFACTURING THEREOF	TOMIOKA, JUNSUKE
<u>09014048</u>	<u>6056931</u>	150	01/27/1998	SILICON WAFER FOR HYDROGEN HEAT TREATMENT AND METHOD	TOMIOKA, JUNSUKE

				FOR MANUFACTURING THE SAME	
<u>09015132</u>	<u>5885347</u>	150	01/29/1998	APPARATUS AND METHOD FOR LIFTING SINGLE CRYSTALS	TOMIOKA, JUNSUKE
<u>09025570</u>	Not Issued	161	02/18/1998	MANUFACTURING METHOD OF A SILICON WAFER AND THE SILICON WAFER	TOMIOKA, JUNSUKE
<u>09048302</u>	<u>5942033</u>	150	03/26/1998	APPARATUS AND METHOD FOR PULLING UP SINGLE CRYSTALS	TOMIOKA, JUNSUKE
<u>09088657</u>	<u>6099642</u>	150	06/02/1998	APPARATUS FOR PULLING UP SINGLE CRYSTALS AND SINGLE CRYSTAL CLAMPING DEVICE	TOMIOKA, JUNSUKE
<u>09121858</u>	<u>6042644</u>	150	07/24/1998	SINGLE CRYSTAL PULLING METHOD	TOMIOKA, JUNSUKE
<u>09160426</u>	Not Issued	161	09/24/1998	SEED-CRYSTAL HOLDING DEVICE USED IN A SINGLE-CRYSTAL MANUFACTURING APPARATUS AND METHOD FOR FABRICATING THE SAME	TOMIOKA, JUNSUKE
<u>09251399</u>	<u>6171393</u>	150	02/17/1999	SEED CRYSTAL AND METHOD OF MANUFACTURING SINGLE CRYSTAL	TOMIOKA, JUNSUKE
<u>09336906</u>	<u>6270575</u>	150	06/21/1999	APPARATUS AND A METHOD OF MANUFACTURING A CRYSTAL	TOMIOKA, JUNSUKE
<u>09396107</u>	<u>6179910</u>	150	09/14/1999	METHOD FOR MANUFACTURING SILICON SINGLE CRYSTAL AND WAFERS ADAPTED FOR PRODUCING SEMICONDUCTORS	TOMIOKA, JUNSUKE
<u>09410723</u>	<u>6315827</u>	150	09/30/1999	APPARATUS FOR PRODUCING SINGLE CRYSTAL	TOMIOKA, JUNSUKE
<u>09422711</u>	Not Issued	161	10/21/1999	METHOD FOR DETECTING THE INSERTION OF CLAMPING MEMBERS INTO THE SMALL-DIAMETER RECESS PORTION OF A SINGLE-CRYSTAL BODY AND DEVICE FOR LIFTING	TOMIOKA, JUNSUKE

				SINGLE-CRYSTAL BODIES	
<u>09425019</u>	<u>6179911</u>	150	10/25/1999	METHOD FOR MANUFACTURING SINGLE CRYSTAL	TOMIOKA, JUNSUKE
<u>09544556</u>	<u>6273944</u>	150	04/06/2000	Silicon wafer for hydrogen heat treatment and method for manufacturing the same	TOMIOKA, JUNSUKE
<u>40512022</u>	Not Issued	30	10/19/2004	Single crystal silicon producing method, single crystal silicon wafer producing method, seed crystal for producing single crystal silicon, single crystal silicon ingot, and single crystal silicon wafer	TOMIOKA, JUNSUKE

Inventor Search Completed: No Records to Display.

Search Another: Inventor	Last Name	First Name	Search
	<input type="text" value="Tomioka"/>	<input type="text" value="Junsuke"/>	

To go back use Back button on your browser toolbar.

Back to [PALM](#) | [ASSIGNMENT](#) | [OASIS](#) | [Home page](#)